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The Gliding Federation of Australia Inc.

Operational Safety Bulletin

No. 01/14 (Revision 3)

Circuit and Landing Advice

Background

This Bulletin was initially issued in January 2007 as 'Landing Advice' OSB No 01/07 in response to a trend in 'heavy landing' accidents and was updated again in July 2011 for similar reasons. Disappointingly, landing accidents continue to occur at a regular rate and usually result in damage to the glider and occasionally injury to the pilot. As many landing accidents occur because of poor workload management or judgement in the circuit, the scope of advice was expanded in a new bulletin, OSB 01/14, issued in July 2014.

Since the introduction of the online reporting system in 2011, we can now see with clarity that a high proportion of accidents occur during the landing phase of flight.

The following accident statistics are for a 12-month period (ending 31 December) for each of the last six years:

	2014	2015	2016	2017	2018	2019
Controlled Flight into Terrain	1	2	0	4	1	0
Hard Landing	8	24	8	14	7	17
PIO	1	2	4	1	1	2
Wheel-up event	18	15	15	9	6	5
Sub Total:	**28**	**43**	**27**	**28**	**15**	**24**
All other accidents:	38	49	45	44	41	35
Total:	**66**	**92**	**72**	**72**	**56**	**59**
Fatalities	**0**	**1**	**0**	**4**	**1**	**0**
Injuries	**8**	**10**	**10**	**8**	**4**	**7**

It is recognised that landing accidents occur under a wide range of circumstances and many happen because of pressure brought on by other in-flight situations that result in a decline in pilot performance. As the landing is a critical flight phase requiring high performance, it is understandable that pilots under unusual pressure will sometimes not perform well at this time.

The following advice is provided to remind pilots and instructors of good circuit and landing techniques. Instructors are requested to give these techniques emphasis during annual flight reviews, as well as during training.

Introduction

A good landing is a result of a good circuit. Importantly, a good circuit results from good flight management from the time the glider descends below 2,000' AGL.

Good flight management as it relates to good landing means that, at low height and regardless of whether the pilot intends to land, the glider is flown so as to ensure it can always join circuit at a safe height and commence a normal downwind leg.

Below 2,000'AGL, searching for lift and other upper air activities should normally be conducted upwind of the circuit joining area. Pilots electing to ignore this norm must ensure they maintain sufficient height to get back to the circuit area, avoiding conflict with other traffic, and execute a normal downwind leg.

The Break-off Point

During every flight the pilot must consider when to start heading for the circuit joining area. In making the decision to transition from a ‘soaring pilot’ to a ‘landing pilot’, one needs to:

- Assess the wind strength and direction (check the windsock if at an airfield) and consider the likely effects of wind and gradient.
- Choose the circuit direction and the location for the circuit joining area — a stronger wind might need a circuit joining area further upwind.
- Assess the effect of crosswinds on the circuit. A crosswind away from the airfield might mean a circuit joining area closer in and a shorter base leg, whereas a crosswind towards the field would suggest a circuit joining area further out and a longer base leg.
- Check the landing area. There is no point in starting a circuit to one that is unsuitable or blocked.
- Determine an ‘Approach Speed’ for the conditions (1.5Vs plus ½ wind speed).
- Make a positive decision to join the circuit to land, and plan to arrive at the circuit joining area at an appropriate height for the conditions.

Since landing mishaps usually occur due to poor workload management, it is important to get some of the tasks out of the way early and prepare for landing by:

- Making sure the straps are tight.
- In gliders so equipped, dump any water ballast, lower the undercarriage and set the flaps, trimming to an appropriate speed for the downwind leg.
- Make sure the radio is on the correct frequency, that volume and squelch are correctly set, and that the microphone is positioned for best performance.

Note: The purpose of the circuit is to arrive at the final turn in the right place, at a safe height (at least 300ft AGL) and speed, and with safe alternatives always available. At an airfield it has the further purpose of setting up an orderly flow of traffic.

At the Circuit Joining Area

The circuit joining area is a most hazardous area for collisions as aircraft funnel to this point to commence their circuit. It is therefore vital that all pilots maintain good situational awareness within this high-risk area.

Pilots should be familiar with the aerodrome layout and have radio frequencies set, so their attention can be directed outside the aircraft, looking for other traffic and maintaining a listening watch while responding appropriately to applicable transmissions. Pilots should broadcast their intentions by making the standard positional broadcasts and other broadcasts as necessary in the interests of safety.

As previously mentioned, early completion of configuration changes and checklists will help to minimise distractions at this critical time.

Pilots must judge the angle and distances from the landing area and check that it is clear of obstructions. At the height of the Circuit Joining Area the eye is as ‘accurate’ as the altimeter, and more accurate the lower we get. For these reasons the judgement of height in the circuit must rely on the eye rather than the altimeter.

Begin the downwind leg at an appropriate height for the conditions and correct for any drift. If low or shallow, fly a closer downwind leg or choose an alternative landing area and replan the circuit. If too high or steep, fly the downwind leg further out.

The Downwind leg

The downwind leg allows us time to judge our progress and make any adjustments, while always retaining safe alternative approach paths. Alternative approach paths are necessary because:

- We are all fallible and can make mistakes.
- We may fly into unexpected lift or sink.
- The landing area may become blocked.

Adjustments on the downwind leg consist of angling the leg in or out in order to shorten or lengthen the base leg.

Having begun the downwind leg and made any necessary adjustments to it and the choice of landing area, continue to keep a good lookout, flying the glider at an appropriate speed, i.e. safe speed near the ground is at least 1.5Vs. It is also important to monitor the variometer, as a situation that was normal at the circuit joining area may become something else if lift or sink are encountered.

During the downwind leg the pilot will:

- Regularly assess height, angle and position, making adjustments as necessary;
- Check that the landing area is still clear of obstructions, look out for other aircraft ahead in the circuit and consider them as possible obstructions; and
- Consider other aircraft behind (and sometimes ahead or abeam) and avoid obstructing them.

Keep checking that your intended landing area is clear of gliders and other obstructions - cars may drive across it towing gliders, people may wander out leisurely to the launch point, etc. Consider any circuit traffic ahead of you that may clutter the landing area just before you arrive.

Always have a contingency plan in case your first choice of landing area becomes obstructed. If it is obstructed, it is usually better to make the first part of the approach with the brakes closed and land long. Many gliders have been damaged by pilots attempting to land through a very narrow gap or trying to stop before the obstruction. Good airmanship would also dictate that you position your landing to avoid making life difficult for aircraft following you around the circuit.

Increase your speed to the Approach Speed to allow for the wind and re-trim early in the downwind leg and before you near a position adjacent to your intended landing area. Again, assess height, position, and angle and make any necessary adjustments to the circuit, such as:

- Shortening or lengthening of the base leg, turning directly towards the position of the final turn or widening the circuit.
- Shortening the downwind leg by turning early onto the base leg, usually combined with displacing the landing area into wind.

- Choosing a new landing area and/or direction or using the airbrakes to get rid of any excess height. If the height is very excessive caution should be exercised when using the airbrakes to let down in a straight line as there could be another glider underneath.
- Identify the landing area and consider how far back the base leg and final turn should be from it in the prevailing conditions.
- Review your approach speed. Adjust and re-trim to fly it if you have not done so previously.
- Keep a good lookout at this stage and fly the leg at the chosen approach speed.

During the downwind leg remember to check the wind-speed and direction by whatever means are available. This information is important for selection of the Base Turning Point, for predicting drift on the base leg and for establishing the speed to use on final approach.

Poor workload management in the circuit can be improved by heightening pilot awareness that they have a very limited time available in which to make radio calls, position the glider correctly, complete pre-landing checks, and then adjust position, angles and energy for the conditions, particularly on downwind leg. In strong winds, the groundspeed on downwind leg will be much higher, reducing the time available, hence the increased importance of managing tasks versus time, of getting the glider configured correctly for landing early.

Aiming Point selection

The Aiming Point is the point where the glider hits the ground if we don't bother to round-out. The point where the actual round-out begins is some way before the Aiming Point, the exact distance depending on the wind strength and/or steepness of the approach. Starting from the place where we want the glider to stop, work back towards the round-out point, allowing for:

- Length of ground roll and float after the round-out - (surface condition, glider type, wind and approach speed).
- Approach obstructions or curl over or wind shadow that may preclude an ideal Aiming Point.

Approach Speed

Ideally, the Approach Speed (i.e.1.5Vs plus ½ wind speed) is set **early** on the downwind leg **and before** the glider is adjacent to your intended landing point. The two most important reasons for this are: -

1. It may not be possible to recover from an inadvertent spin at circuit height. For this reason, set the approach speed early in the downwind leg - and certainly no later than just **before** the glider is adjacent to your intended landing point; and
2. To simplify the assessment of height (via the angle down to the landing area) by eliminating the complication of angular change due to the exchange of height for speed. This is particularly important from the position abeam the landing area, after which the options for adjusting the circuit are limited. The loss of height and time occasioned by this earlier increase in speed is small and is well worth the extra safety margin achieved.

Pre-Landing Check

The pre-landing check should be completed once the approach speed has been set and the aircraft trimmed.

Caution: The pre-landing check (refer MOSP 2, Appendix 1) **is a check and not an action list**. The check should verify the undercarriage lever is matched to the lowered position on the placard, that flaps are set as required, and that approach speed and trim has been set.

Final turn position

A mental picture of how far back the final turn should be in the prevailing conditions helps assess when to turn onto the base leg. If this ‘habit’ is established at an early stage it will make circuits to land at unfamiliar sites and in fields easier.

A successful and easy landing needs a straight approach from a final turn that is no lower than 300’. Turns below 300' can be dangerous, due to:

- the different effects of any wind gradient on the raised and lowered wings
- high workload
- reduced time on the approach.

Note: A judgement must be made that the final turn can be conducted at a safe height above the ground, noting the effect of wind gradient and wind shear during the final turn. If the glider is very close to the ground, it may not be safe to make a final turn, and the effect of wind gradient may cause over-banking, or wingtip contact may cause the glider to cartwheel or, at best, ground loop. A controlled landing, even into rough ground or vegetation, is usually preferable to an uncontrolled arrival with high vertical velocity. Modified circuit or alternate landing area options should therefore be executed early, when there is energy to spare.

Base Leg

The turn onto the base leg is made soon after passing abeam the selected landing area, and before the angle to the landing area starts to shallow. Don’t ‘crowd’ yourself or fly too far downwind. Position the base leg to allow sufficient time to judge progress and make adjustments to the flight path; and always have safe alternative approach paths available.

Usually, the base leg will be at right angles to the landing direction but may contain more than one straight section, not necessarily at right angles to the landing direction. Position it so that if there is any likelihood of ‘running out of height’, a safe final turn can be made to an alternative approach. A base leg at right angles to the approach makes it easier to confirm the wind strength from the drift correction required.

- Look for other traffic ahead on the circuit, joining from downwind, on long finals or on the base leg from a circuit in the opposite direction and maintain a listening watch.
- Identify controls - airbrakes and flaps. Place hand on airbrake/spoiler.
- Continue to check the attitude and ASI regularly.
- Check the landing area is still free from obstructions.
- Continue monitoring the height (not from the altimeter but the apparent size of buildings, trees etc.), and the angle and distance. The only adjustments available on the base leg are: -
  - if you are too low or too far away make an early final turn. This may require the choice of an alternative landing area and/or direction.
  - if you are a little too far away but sufficiently high, angle in.
  - if a little too close but sufficiently high, angle out a bit.
  - if high but at the correct distance, use the airbrakes with care.

Approaching the final turn

Before turning onto final approach, the lookout should be as careful outside the turn (for other aircraft on long final approaches) as inside. Again, check for anyone on an opposing circuit. Decide when to turn, allowing for any head or tailwind component. Don’t turn early as this can lead to an under-banked turn and less time straight on the approach.

Check the speed again and monitor it regularly.

Some pilots at this stage of the circuit will re-check that the undercarriage is down and locked. This is the last opportunity to confirm this, as the final approach stage involves a high workload, and this is the wrong time to be playing with undercarriage.

Because of the importance of speed control in the final turn it is not usually a good idea to open airbrakes or increase brake settings. If the glider is excessively high - and provided speed is carefully monitored - open the brakes and lower the nose to maintain the approach speed before the final turn, and keep them open during the turn. It is not usually a good practice to open the airbrakes during the turn. For this reason, many clubs require airbrakes to remain closed in the final turn, unless exceptional circumstances require otherwise. Also be aware that judgement of rate of height loss in turns is more difficult.

The Approach

The Final Turn to Approach

The final turn should be a normal (30º) banked turn, similar to the one onto the base leg. Upon completing the turn and with the wings level, line the glider up into the landing area and make an approach. The turn should be initiated early enough to avoid overshooting the centreline of the intended approach. Note that the lower the height approaching the final turn, the harder it will be to anticipate the turn radius and ground rush may affect airspeed judgement. There will also be an increased risk of overshooting the final turn; thereby increasing the risk of a high-bank turn and further manoeuvres necessary to align with a safe approach path while close to the ground.

The final turn must be conducted at a safe height, preferably not lower than 300ft AGL, and at the calculated approach speed, having regard to the local conditions. Good energy management is critical to safety, and to setting up a good stable approach from which a safe landing can be conducted. There is strong evidence to suggest that poor landings, or landings causing damage or injury, are much more likely to result if the final turn is executed too late, too close to the ground or with poor energy management, all of which make a stabilised approach and controlled landing much more difficult.

Early in the Approach

Once the turn is completed, the Approach Speed, flap setting and heading are re-checked, adjusted if necessary, and then maintained until the flare or round out.

The glider’s position relative to the final approach path towards the intended landing area is now assessed. Airbrakes/spoilers should not be used until the pilot has assessed that the aircraft is beginning to unmistakeably overshoot the intended touchdown area and will clear all obstructions. Airbrakes/spoilers are then used as required to maintain the correct final stabilised approach path.

The Stabilised Approach

A glider on the correct approach path, going in exactly the right direction at the correct approach speed is said to be on a stabilised approach. A stabilised approach maximises your chances of achieving a good landing.

Control the descent path with the airbrakes and the speed with the elevator. Be prepared to close the brakes and land long to clear obstructions.

Ensure all obstacles on the approach are cleared by at least 50 feet.

Use of Airbrakes/Spoilers

The final glide path is based on a half to two-third airbrake setting, therefore the airbrakes/spoilers will only be used to a sufficient degree to maintain this glide path. It must be stressed that elevator is the speed control, airbrakes or spoilers are used to control the rate of descent.

Although the amount of airbrake/spoiler used during the approach will probably have been varied to maintain the aircraft on the final glide path, the recommended setting for landing should be made before the flare or round out is commenced. **This setting should then ideally remain unaltered until touchdown.** Once the aircraft has touched down the airbrakes/spoilers can be fully deployed to reduce the length of the ground run.

Landing

The aim in landing is to fly the glider just above the ground so that it will touch down gently at the minimal possible speed, for a smooth and safe ground roll clear of obstacles. The landing phase covers the transition from the stabilised approach, through a flare and hold-off, then a ground roll, until stationary.

Late Final Approach

The stable approach should be maintained at the nominated approach speed. When clearance of any obstacles[1] (airfield boundary, fence, etc.) is assured, the approach should continue ideally in most gliders at approximately half airbrake/spoiler. Any tendency to undershoot or overshoot the aiming point should be corrected by appropriate adjustment of the airbrake/spoiler settings.

Ground proximity wind shear should be compensated for by reducing airbrake as necessary.

At the end of the stabilised approach, when the ground ahead appears to flatten out, the pilot's gaze should be transferred away from the aiming point forward about three to four hundred metres. This stage of the late final approach is used to judge the correct transition into the flare or round out.

The Flare (or Round Out)

The phase during which the approach descent rate is arrested and changes to zero with the glider flying parallel to the ground is called the flare, or round-out. The nose of the glider should be raised to arrest the rate of descent and prevent the glider from flying into the ground.

The judgement/perception aspects of the round-out phase depend on changes in the perspective of the landing area. These are most obvious on a runway or other well-defined, large and regularly shaped area. Take care on sites which are not flat as there are apparent changes of perspective on sloping or uneven fields. In other circumstances unusual perspectives can lead to approaches that are either too low or too high, depending on which way the slope lies in relation to the glider. This can cause problems with where to look ahead for the round-out, and consequently with the round-out itself.

For consistently good landings, pilots need to develop an attuned awareness of the following:

- Peripheral vision providing some textural information - when the grass looks like grass - as well as vital clues to the glider's rate of sink;
- The changing attitude of the glider and the control movement required;
- The rate of change of attitude and/or perspective; and

[1] As a guide, obstacles should be cleared by at least 50ft.

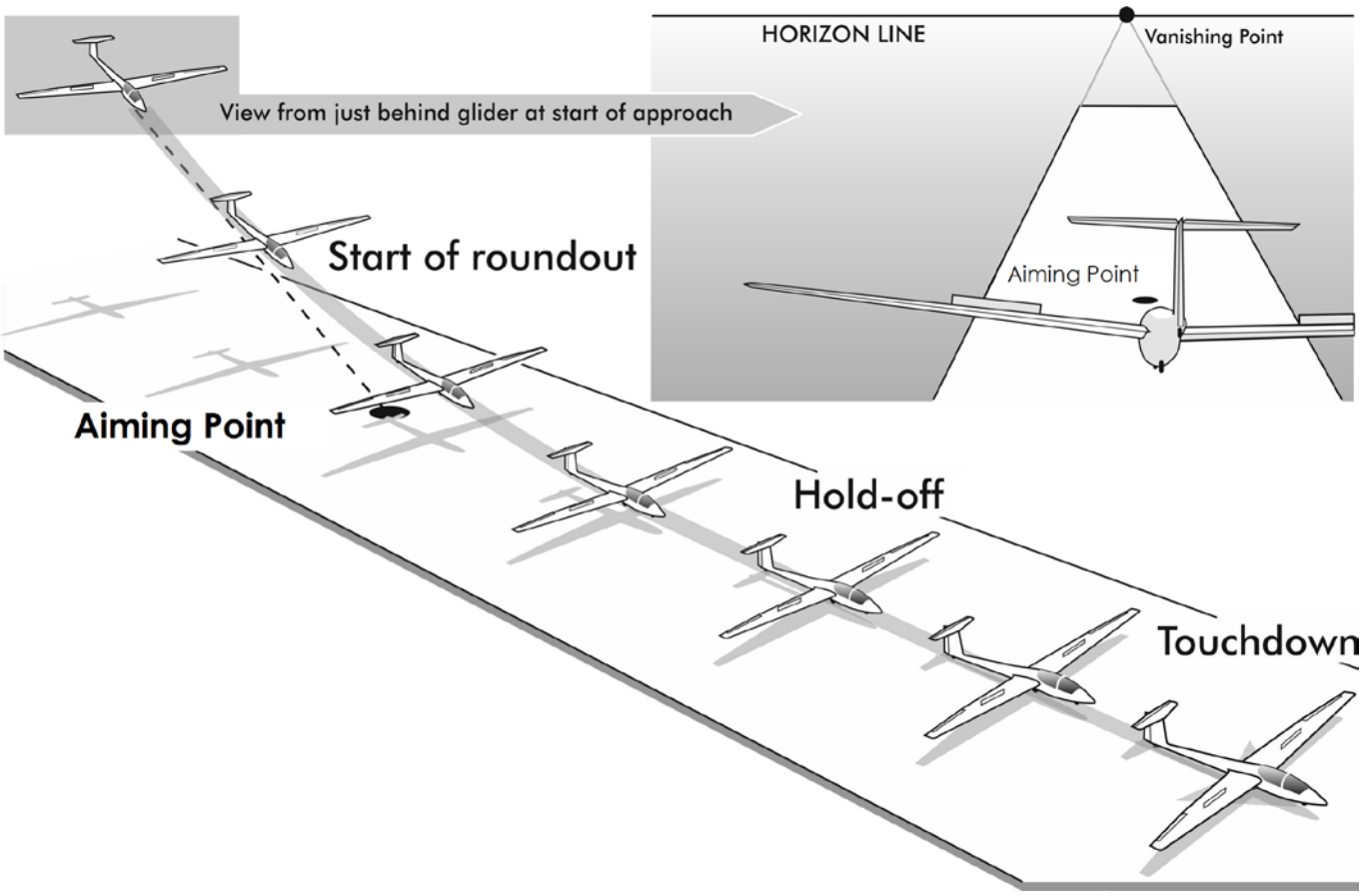
- The steepness of the initial approach. Given the same airbrake setting, the round-out will begin higher up for a steep approach in a strong wind than for one in no wind.

Caution: The primary flight control during the flare and round out is the elevator…not the airbrake.

The closing of the airbrakes in the final stages of the approach should only be contemplated when: -

- The speed is decaying too quickly to allow safe completion of the round-out, and the glider is too close to the ground for the pilot to be able to lower the nose.
- Lowering the nose is not increasing the speed fast enough.

Small amounts of airbrake often lead to PIOs when the speed doesn't decay soon enough, or as expected, during the hold-off. Landings are also easier when made with half airbrake, as during the round-out and hold-off the rate of decay of the speed is comparable with a comfortable rate of elevator movement.



The Hold-off

After the flare the glider is flown parallel to and just above the ground. This non-descending path of the glider after the flare is called the hold-off. Failure to hold-off will often result in a heavy or ballooned landing. The hold-off phase should be sustained at a steady height just above the ground.

As the speed decays the glider will inevitably sink and the stick will have to be brought further and further back to prevent this. Eventually the glider will 'land itself', settling onto the ground in the touchdown attitude at MINIMUM ENERGY. Maintain a landing attitude until the end of roll, not just touchdown.

There is no need to actively ‘land’ the glider by flying it on at speed, as this is likely to result in a bounce and ballooned landing. Pilots may need to relax the back-pressure and close airbrakes should the glider balloon.

Touch Down and Ground Roll

In a properly executed landing, where the touch down is achieved with minimum energy the glider will settle onto the ground in the two-point touch down attitude with no tendency to bounce or resume flying. In a fully held off landing the glider’s tail wheel touches the ground fractionally before the main wheel. The stick will be well back and the glider effectively stalled. This gives the slowest possible touch down speed. Should the glider hit a bump, it will not take-off again and any impact with items like embedded stones, for example, will be lessened.

Once the glider has touched down, open the airbrakes fully (watch out for any coupled wheel brake!) and bring the stick progressively back to the stop if it is not there already. This:

• Prevents the glider taking off again.

• Prevents damage to the nose skid, if the glider has one.

• Initially, slows the glider down more quickly.

• If the glider has a tailwheel it helps keep it straight on the ground run.

• May enhance the aileron response at low speed.

Because the stability characteristics of the glider are changed after touch down, the pilot’s priorities are to keep the glider on the ground in the touch down attitude, wings level with aileron and travelling in a straight line using rudder until it rolls to a stop. As the speed decays, larger and larger control movements will be required to keep the wings level and/or steer the glider. Like the ground run on take-off, this is another occasion where independent use of the ailerons and rudder may be required. Wheel brake should be applied, as necessary.

Potential Problem Areas

- A good landing is the natural culmination of a well-executed, accurate circuit followed by a stabilised final approach.
- Failure to look far enough ahead during the final approach is the prime cause of early students being unable to judge the flare/round out.
- Incorrectly judged flares/round outs generally lead to ballooning in cases where up elevator is excessive, or to bounced landings where the flare/round out is left too late.
- Sometimes students and pilots may have difficulties such as Pilot Induced Oscillations, or coarse deviations leading to bounces, flying onto the ground, rough or inconsistent landings. Instructors should be attentive to such signs as indicative of high pilot stress, including high forces in control inputs, and coarse control movements. A key issue is to assist the student in relaxing, in using fine motor skills and smaller control movements as they look well ahead to monitor height and movement. A "long float" landing with an instructor is a useful training exercise.
- Movement of the Aiming Point does not indicate whether the approach is high or low. Judge height by reference to the apparent size of objects, e.g. fences, roads, trees, hangars etc. Judge the steadiness of the approach path in terms of the angle to the aiming point steepening or shallowing or remaining constant – movement up and down the canopy is a good guide.
- Maintaining a constant speed throughout the approach requires good co-ordination between airbrake and elevator.

- In very turbulent conditions the use of large amounts of airbrakes improves the lateral stability but can sometimes increase pitch sensitivity.
- When approaching through a wind gradient a more nose down attitude is needed to maintain a constant airspeed than if the wind remained constant.
- Maintain the speed all the way down to the round-out. In a very strong wind gradient this may not be possible (at hill sites for example) because you would have to finish the approach in a steep, possibly VERY steep dive. Under these circumstances allow for some inevitable decay in the speed by starting the approach at a higher speed than usual.
- If the glider is rounded out too high with safe speed, a level attitude and moderate brake setting, then hold everything still and let the glider sink. Do not open the airbrakes further to reduce height. With less than safe speed and/or nose-up attitude and with the brakes open, close the brakes and gently lower the nose.
- When landing out of wind:
    - Avoid approaching near to obstructions or other gliders so that even if the drift is not fully corrected, there is no danger of drifting too close or swinging towards them after landing. There is also the question of turbulence across the intended approach/landing area from buildings/trees and the like.
    - When the rudder is applied to yaw the glider straight there is a natural tendency for it to bank as well. Prevent this by using the ailerons to keep the wings level. If the glider banks out of wind it will begin to turn and start to drift badly. A firm correction on the rudder will be needed to swing the nose farther out of wind to eliminate the drift.
    - Gliders with the wheel mounted well forward of the centre of gravity have a much stronger tendency to weathercock into wind. If a swing does occur, the greater mass of the glider behind the wheel will worsen the situation. Take special care with these machines. Once a serious swing has developed, the rudder may be totally inadequate to prevent it getting worse. Unless full opposite rudder is applied immediately the glider will almost certainly ground loop, possibly with serious consequences.
    - Many pilots, particularly low time pilots, may have launch point fixation and press on too far when running out of height in the circuit. Modified circuits should be flown so as to ensure the final turn is conducted at a safe height, even if it means landing on other runways or paddocks, or well down the operating runway. Pilots must be trained to resist their instinct to attempt to land at the launch point; safety must override convenience.
- A different take-off and landing direction, or a different airfield or field also means that the progress of the circuit cannot be judged by reference to familiar features on the ground. In the case of a field landing, familiar ground features will either be absent, or rather worse, there, but in a completely different relationship to the chosen landing area.
- If the undercarriage wheel is found to be retracted during the late final approach, roundout or hold-off, it is far better to execute a safe landing with the wheel retracted, than to attempt to lower the wheel and mishandle the hold-off and landing. More serious damage will probably result from a heavy landing.
- Some pilots may display “press-on-itis” or launch point fixation, resulting in reluctance to modify circuits and land long, with a willingness to press on until base legs and final turns are made dangerously low, in order to land as close to the launch point as possible. Instructors must be attuned to such behaviour and intervene to correct over-optimistic decision-making and risk-taking behaviour. Those pilots might get away with it once or twice …then have a heavy landing resulting in damage or injury.

A Note for Powered Sailplane Pilots

Powered sailplanes and touring motor gliders are primarily gliders, so circuits, approaches and landings should be carried out with this in mind.

Circuit flying in powered sailplanes demands a high degree of discipline:

- When flying the circuit engine-off, treat the aircraft as a glider. Restarting the engine to rescue a poor circuit is fraught with danger and should not be attempted. If the propeller is feathered, restarting the engine takes time and adds to workload pressures.
- When flying engine on at a gliding site[2], do not climb a powered sailplane along the downwind leg. This is a dangerous practice because the powered sailplane may be climbing underneath gliders which are descending. Pilots could consider flying a gliding profile in the circuit by maintaining descent power throughout.
- With the 'pop-up' engine type gliders, it is recommended that engine-on landings are not performed. In fact, landing with the engine on is prohibited by some manufacturers, so read the flight manual.
- Noise and turbulence caused by the raised engine or propeller can hide the buffet of an impending stall, so it is even more important to carefully monitor the airspeed during landing.
- Landing with the motor extended but not operating often results in a steep reduction in performance, which can be comparable to flying with the airbrakes extended.
- Unless the Aircraft Flight Manual specifies otherwise, when landing touring motor gliders with the engines operating, the spoilers or airbrakes are used for descent control and the approach is adjusted by their use in conjunction with the elevator.
- Another issue with engine-on landings is the temptation to rescue a mishandled landing by using power. This is generally not possible because we are not equipped with enough hands to cope with all the required actions. The right way to fix any mishandled glider landing is by a combination of attitude and airbrake control.

Conclusions

The circuit is the flexible tool which helps make a good approach. The main benefit of flying a standard circuit is that it allows time for progress to be judged, alternatives considered, and the necessary action to set up a good approach and complete a safe landing; and the pilot maintains a good view of the airfield and landing area.

Good workload management is important to executing a good circuit and focussing on the right things at the right time. For this reason, the glider should be set in 'landing pilot' configuration early. The pre-landing check should be a check that the landing configuration has been set properly, against placards as appropriate.

The exact position of the circuit joining area, the turn onto base leg and final turn will vary with glider type and even more with conditions - particularly wind strength and direction. Early decisions on modified circuits and landing areas must be made to allow a safe final turn at a safe height, as a precursor to a controlled, safe landing.

Good and reliable landing techniques take time and practice to achieve and can deteriorate quickly with lack of currency and/or pressure brought about by difficult or unusual flight

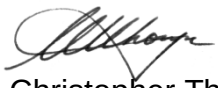
[2] At non-gliding sites, powered sailplanes and motor gliders should follow the circuit procedures relevant to the site.

situations. The decline in personal performance levels possible due to the effects of tiredness, stress, dehydration etc, should never be underestimated.

Pilots should always be “self-critical” of their performance and landings are no exception. It is a good idea to analyse how the circuit and landing went immediately following each flight, as often deterioration in performance can be identified early and remedial actions taken.

Pilots should always be aware that high workload situations during the landing phase often lead to poorly executed landings, sometimes with serious outcomes. Well-developed fundamentally sound landing procedures and techniques are a good safeguard against these outcomes.

It is intended to modify the Instructors Handbook to reflect this advice in the next edition that is currently under development.



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